

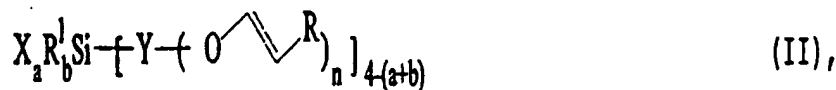
## Claims

1. An ormocer, produced by the hydrolytic condensation of one or more silicon compounds and the subsequent polymerization of organic monomers, wherein said at least one silicon compound comprises vinyl ether radicals of formula (I):

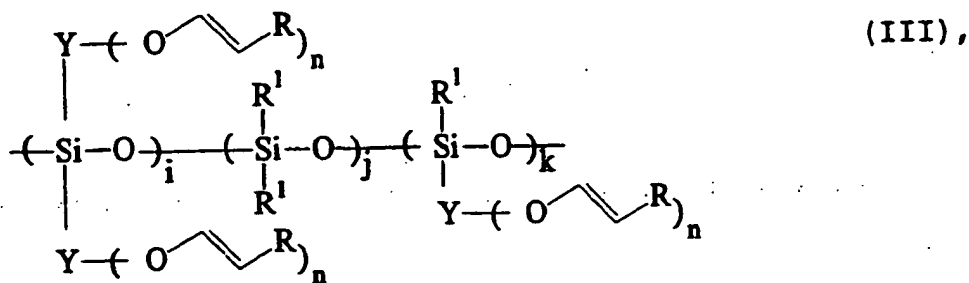


wherein R represents hydrogen, methyl, or ethyl.

2. The ormocer according to Claim 1, wherein said at least one silicon compound is a monomeric silane of formula (II):



wherein R denotes, independently, hydrogen, methyl or ethyl;  $\text{R}^1$ , independently, an aliphatic, cycloaliphatic, or aromatic group with 1 to 20 carbon atoms; X, a hydrolyzable group; and Y, independently, an unsubstituted or substituted, aliphatic, cycloaliphatic or aromatic radical with 1 to 30 carbon atoms, wherein one or more  $\text{CH}_2$  groups can be replaced by O,  $\text{C=O}$ ,  $\text{---CO}_2\text{---}$ ,  $\text{---SiR}_2\text{---}$ , and/or  $\text{---SiR}_2\text{O---}$ ; and a represents a whole number in the range of 1 to 3; b, a whole number, in the range of 0 to 2; and n, a whole number in the range of 1 to 3; or cyclic, branched or linear oligo- or polysiloxanes, comprising structural units of formula (III):



wherein R, R<sup>1</sup>, and Y and the number n have the aforementioned meanings; i, j, and k are,  
independently, a whole number in the range of 0 to 15, wherein, however, i and k cannot  
simultaneously be 0.

3. The ormocer according to Claim 1, wherein the hydrolyzable group is hydrogen,  
halogen, alkoxy and/or acyloxy.

4. The ormocer according to Claim 2, wherein the hydrolyzable group is hydrogen,  
halogen, alkoxy and/or acyloxy.

5. The ormocer according to Claim 1, which is obtained by hydrolytic condensation  
in the presence of a basic catalyst.

6. The ormocer according to Claim 2, which is obtained by hydrolytic condensation  
in the presence of a basic catalyst.

7. The ormocer according to Claim 5, the basic catalyst is NH<sub>3</sub>, NaOH, KOH,  
and/or methylimidazole.

8. The ormocer according to Claim 6, the basic catalyst is NH<sub>3</sub>, NaOH, KOH, and/or  
methylimidazole.

9. The ormocer according to Claim 1, wherein the vinyl ether radicals of formula (I)  
are polymerized cationically after the hydrolysis.

10. The ormocer according to Claim 2, wherein the vinyl ether radicals of formula (I)  
are polymerized cationically after the hydrolysis.

11. The ormocer according to Claim 9, wherein the polymerization is initiated by  
light.

12. The ormocer according to Claim 10, wherein the polymerization is initiated by light.

13. The ormocer according to Claim 9, wherein additional cationically polymerizable monomers are added before the cationic polymerization.

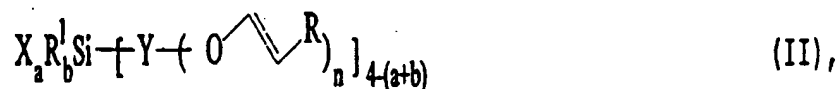
14. The ormocer according to Claim 10, wherein additional cationically polymerizable monomers are added before the cationic polymerization.

15. A method for the production of an ormocer according to Claim 1, comprising mixing a plurality of silicon compounds comprising vinyl ether radical of formula (I)



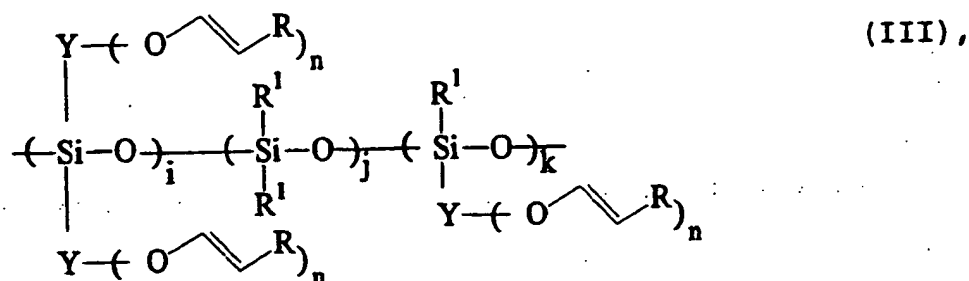
wherein R represents hydrogen, methyl or ethyl, then hydrolyzing the silicon compounds under basic conditions and subsequently cationically polymerizing ethylenically unsaturated groups.

16. A method for the production of an ormocer according to Claim 1, comprising mixing a plurality of silicon compounds comprising vinyl ether radical of formula (II)



wherein R denotes, independently, hydrogen, methyl or ethyl; R<sup>1</sup>, independently, an aliphatic,

cycloaliphatic, or aromatic group with 1 to 20 carbon atoms; X, a hydrolyzable group; and Y, independently, an unsubstituted or substituted, aliphatic, cycloaliphatic or aromatic radical with 1 to 30 carbon atoms, wherein one or more CH<sub>2</sub> groups can be replaced by O, C=O, -CO<sub>2</sub>-, -SiR<sub>2</sub>-, and/or -SiR<sub>2</sub>O-; and a represents a whole number in the range of 1 to 3; b, a whole number, in the range of 0 to 2; and n, a whole number in the range of 1 to 3; or cyclic, branched or linear oligo- or polysiloxanes, comprising structural units of formula (III):



wherein R, R<sup>1</sup>, and Y and the number n have the aforementioned meanings; i, j, and k are, independently, a whole number in the range of 0 to 15, wherein, however, i and k cannot simultaneously be 0, then hydrolyzing the silicon compounds under basic conditions and subsequently cationically polymerizing ethylenically unsaturated groups.

17. A dental material comprising a filler and the ormocer according to claim 1.
18. A dental material comprising a filler and the ormocer according to claim 2.

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